

Science Day Celebration - 2017

Workshop on Nanoscience and Nanotechnology @ IIT Kanpur

Wednesday, March 01, 2017

Schedule

Inauguration (Venue: BSBE Seminar Room)

14:45 - 15:00 Tea

Time	Program
15:00	Sandeep Verma: Welcome and introduction
15:03	S. Ganesh, Dean: Research and Development
15:05	Indranil Manna, Director

Schedule [10 minute talk + 3 minute for question & answers]

Nanoscience @ IIT Kanpur (Venue: BSBE Seminar Room)

Time	Dept.	Speaker	Title
15:10 - 15:23	BSBE	Ashok Kumar	Nano-bioplatforms for theranostic applications in chronic diseases
15:23 - 15:36	CHE	Animangsu Ghatak	Hierarchical, patterned surfaces for variety of applications
15:36 - 15:49	BSBE	Dhirendra S. Katti	Nanoparticles: From fundamentals to nanomedicine
15:49 - 16:02	CHM	T. Gopakumar	Molecular 2D Materials on Surfaces
16:02 - 16:15	CHM	Sandeep Verma	Nanobio conjugates in catalysis, drug delivery and nerve regeneration

16:15 - 16:30 Tea Break

Nanotechnology @ IIT Kanpur (Venue: BSBE Seminar Room)

Time	Dept.	Speaker	Title
16:30 - 16:43	EE	Yogesh Singh Chauhan	Fabrication and modeling of nanoscale switches for IC design
16:43 - 16:56	CHE	Nishith Verma	Carbon-based nanocomposite materials for environment, energy and health applications
16:56 - 17:09	CHE	Sri Sivakumar	Nanoengineered materials for biological, energy and catalytic applications
17:09 - 17:22	ME/MSP	Kamal Kar	Colorful journey of Nanosrishti Technologies Private Limited
17:22 - 17:35	EE	Shilpi Gupta	Nanophotonic devices operating at room temperature
17:35 - 17:48	MSE	Kantesh Balani	Adhesion strength of biological cells

Science Day Lecture (Venue: Outreach Auditorium)

17:50 - 18:10 Tea and snacks

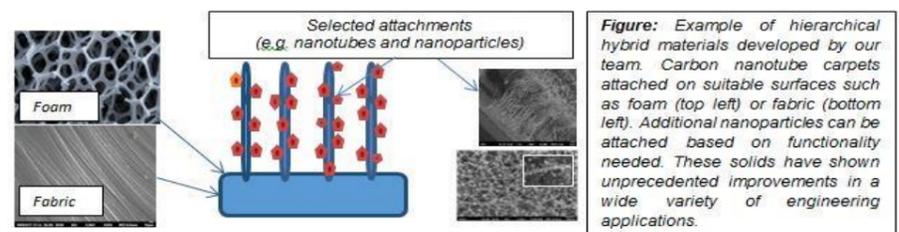
Time	Speaker	Title
18:15 - 19:00	Sharmila M Mukhopadhyay	Next Generation Nanotechnology: Balance and Sustainability

19:00 - 19:05 S. Ganesh : Concluding remarks

Abstract

Nanomaterials and related technologies are beginning to impact almost every aspect of modern life ranging from energy, food and drugs to electronics, aerospace, and infrastructure. The power of nanotechnology comes from unique properties of nano-scale solids such as ultra-high surface area, quantum confinement and interaction with living systems. While these properties provide unprecedented benefits, they also bring the risk of easy environmental proliferation and unintended toxicity. Therefore, an evidence-based approach of balancing R&D activities with health and environmental safety is necessary for sustainable development of nanotechnology. This talk will provide an overview of different facets of this field, and its vast possibilities in different industry sectors.

General overview will be followed by few specific examples from our laboratory, where we investigate design, fabrication, and processing-structure-property-relationships of hierarchical hybrid materials, where tailored arrays of nanotubes and nanoparticles are strongly bonded to larger solids. These architectures are inspired by biological surfaces such as microvilli and capillaries, where a large unifying scaffold supports progressively smaller and more specialized attachments to provide extremely high interaction area in very compact space. Such designs are not commonly used in engineered materials due to the complexities of bonding components of different sizes, shapes and compositions into one solid. However, as seen in the attached figure, recent advances in surface science have made it possible to design and fabricate these types of solids, which provide the functional benefits of nanomaterials while minimizing their environmental risks. Diverse engineering applications demonstrated to date include tissue regeneration, composite toughening, enhanced thermal exchange and rapid degradation of pollutants in water.



About the speaker



Dr. Sharmila Mukhopadhyay is Jefferson Science Fellow at the US Department of State, and elected Fellow of the American Ceramic Society. She is also Professor at Wright State University and the founding Director of their Center for Nanoscale Multifunctional Materials. Her B.S. and M.S. degrees are from Indian Institute of Technology and Ph.D. is from Cornell University. Her academic focus has been at the crossroads of nanotechnology and nano-biosciences, with emphasis on safe and sustainable nanomaterials for energy, environment, and biomedical applications. Her work has been featured in multiple media releases, such as the Homeland Security News Wire, AzoNano, PhysOrg, Dayton Daily News, Ceramic Bulletin and Business Journal. She has published well over a hundred papers and obtained research awards from a wide variety of scientific sponsors such as NSF, DOE, AFOSR, AFRL, NASA, EPA, and OBOR, as well as industry.

This year, as Jefferson Science Fellow, she is serving as a senior scientific advisor to the US Department of State. This includes leveraging her science and engineering expertise to create linkages between cutting-edge technical innovations and governmental entities focused on economic development. She is assisting the State Department in advancing international collaborations in the rapidly expanding area of nanotechnology, which impacts both emerging and traditional industrial sectors such as biotech and pharma, transportation, communication, infrastructure, energy, environment, and consumer products

All interested are welcome.

S. Ganesh
Dean of Research and Development